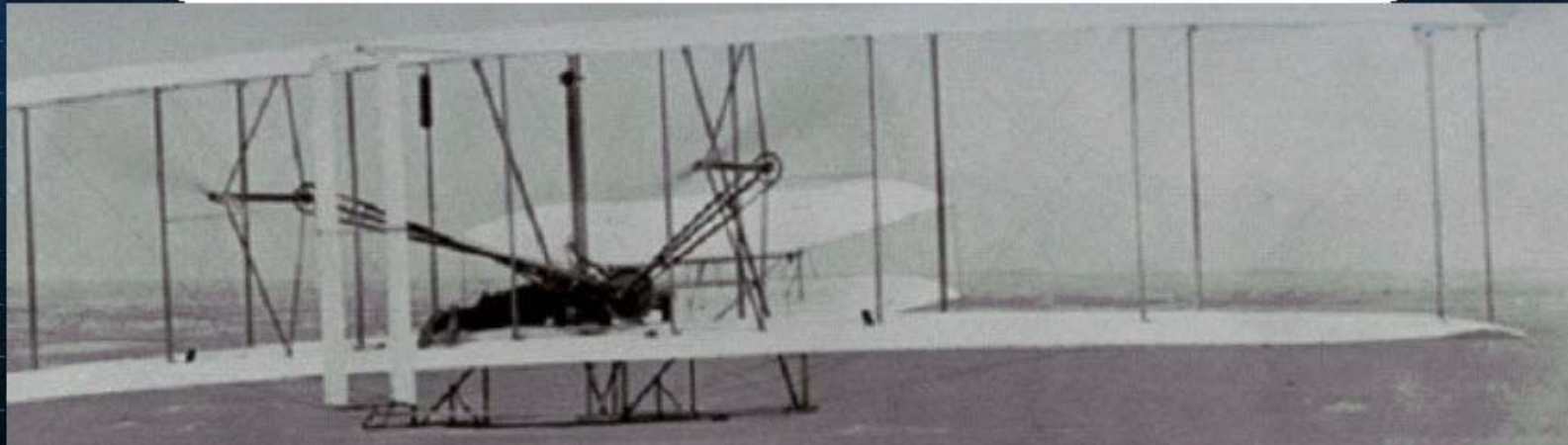


- Dr. J. Victor Lebacqz
- Associate Administrator



Air Traffic Control Association Technical Conference
March 31, 2004

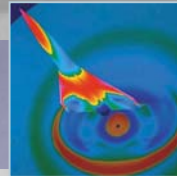
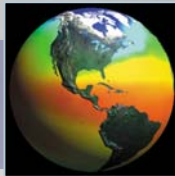


- **NASA Vision**
- National Space Exploration Initiative
- Current Mars Exploration
- Aeronautics Exploration



NASA'S Vision

- To improve life here
- To extend life to there
- To find life beyond



NASA's Mission

- To understand and protect our home planet
 - To explore the universe and search for life
 - To inspire the next generation of explorers
- ...as only NASA can



- NASA Vision
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President's Vision for U.S. Space Exploration



New Space Exploration Vision

*"This cause of exploration and discovery is not an option we choose;
it is a desire written in the human heart." – President Bush*



January 14, 2004





President's Vision for U.S. Space Exploration

- On January 14, the President announced a new space exploration vision for NASA
 - Implement a sustained and affordable human and robotic program to explore the solar system and beyond;
 - Extend human presence across the solar system, starting with a human return to the Moon by the year 2020, in preparation for human exploration of Mars and other destinations;
 - Develop the innovative technologies, knowledge, and infrastructures both to explore and to support decisions about the destinations for human exploration; and
 - Promote international and commercial participation in exploration to further U.S. scientific, security, and economic interests.

- **Return the space shuttle to flight as soon as practical, based on the recommendations of the CAIB**
- **Complete assembly of the International Space Station by 2010**
- **Develop and test a new crewed exploration vehicle (CEV) to explore beyond our orbit to other worlds by 2008**
- **Return to the moon**
 - Robotic missions no later than 2008
 - Extended human expeditions as early as 2015
- **Conduct robotic exploration of Mars and the solar system followed by human expeditions to Mars**



- NASA Vision
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Mast Instruments

Camera

Infrared Spectrometer

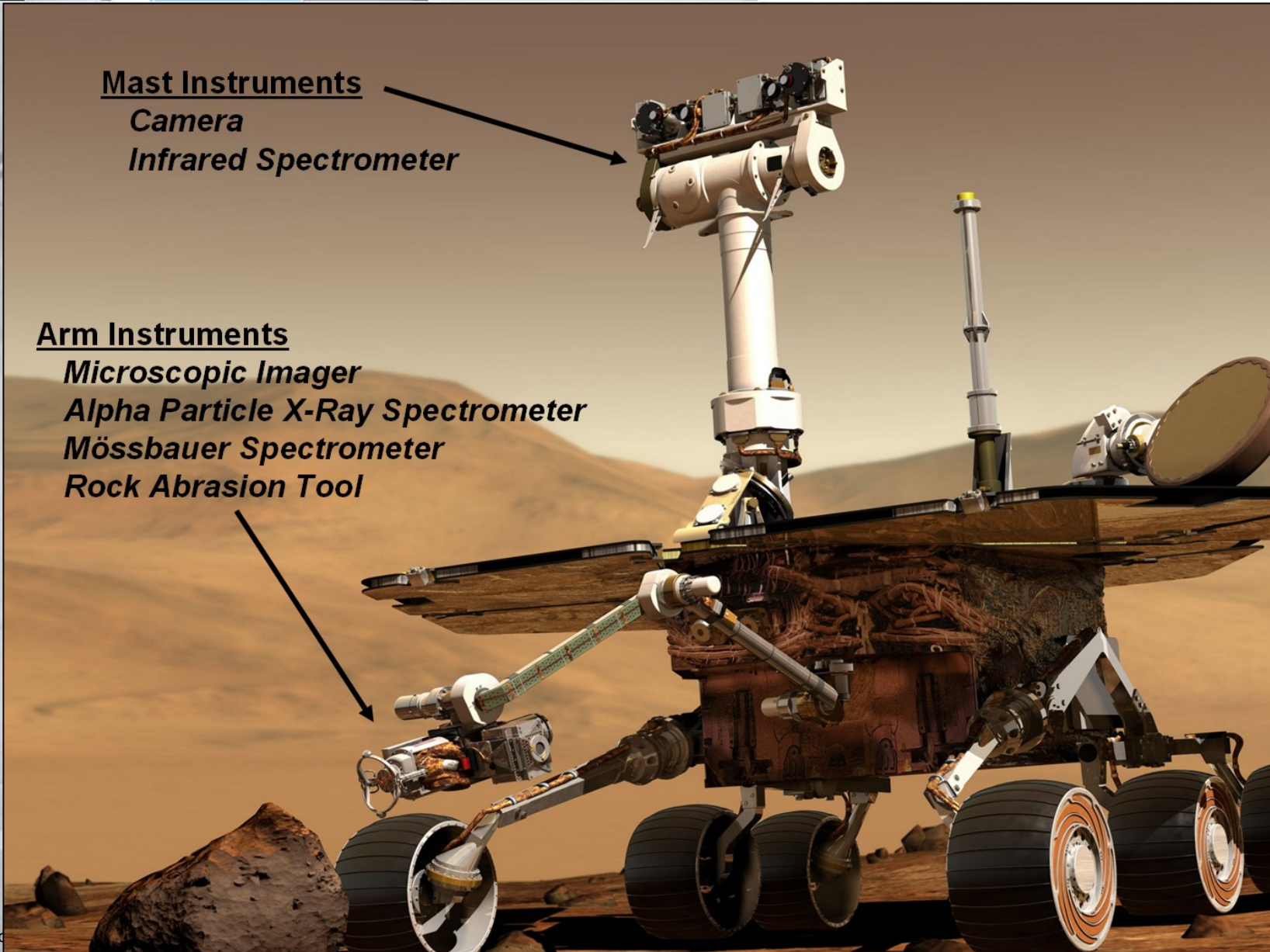
Arm Instruments

Microscopic Imager

Alpha Particle X-Ray Spectrometer

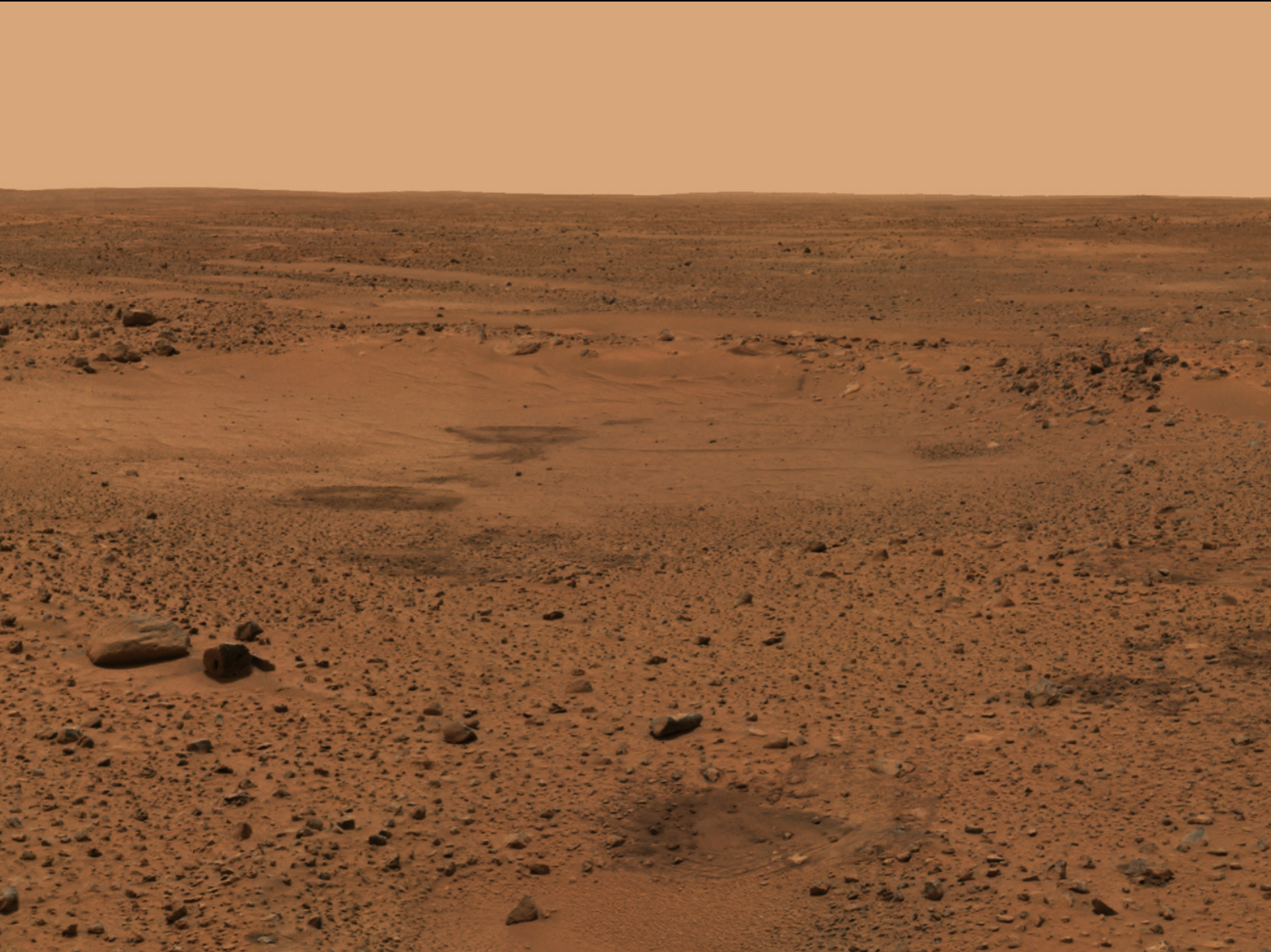
Mössbauer Spectrometer

Rock Abrasion Tool



Sleepy Hollow Depression

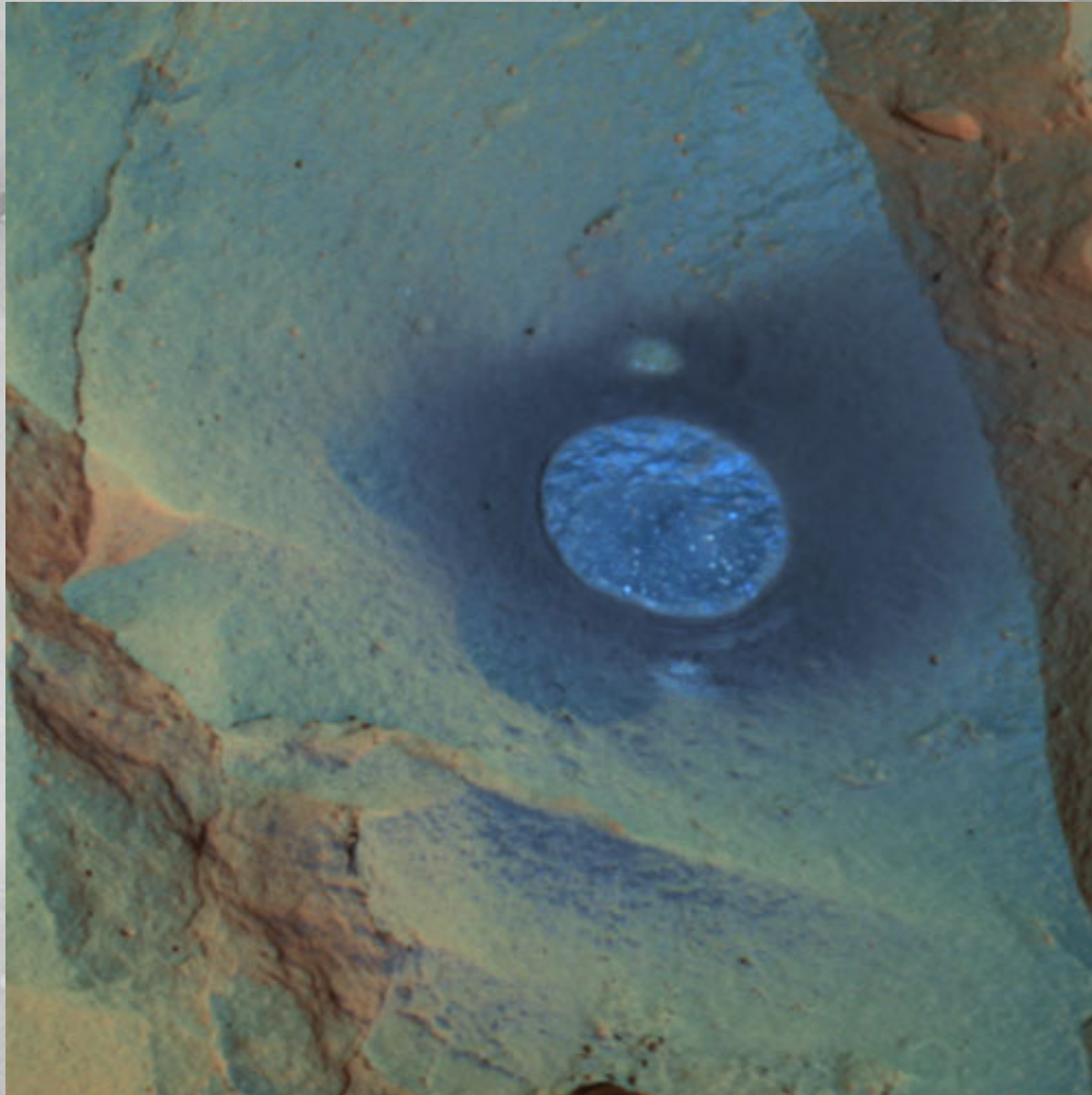
(Day 1 from Spirit)



Dark marks are where airbags bounced on the soil during landing.

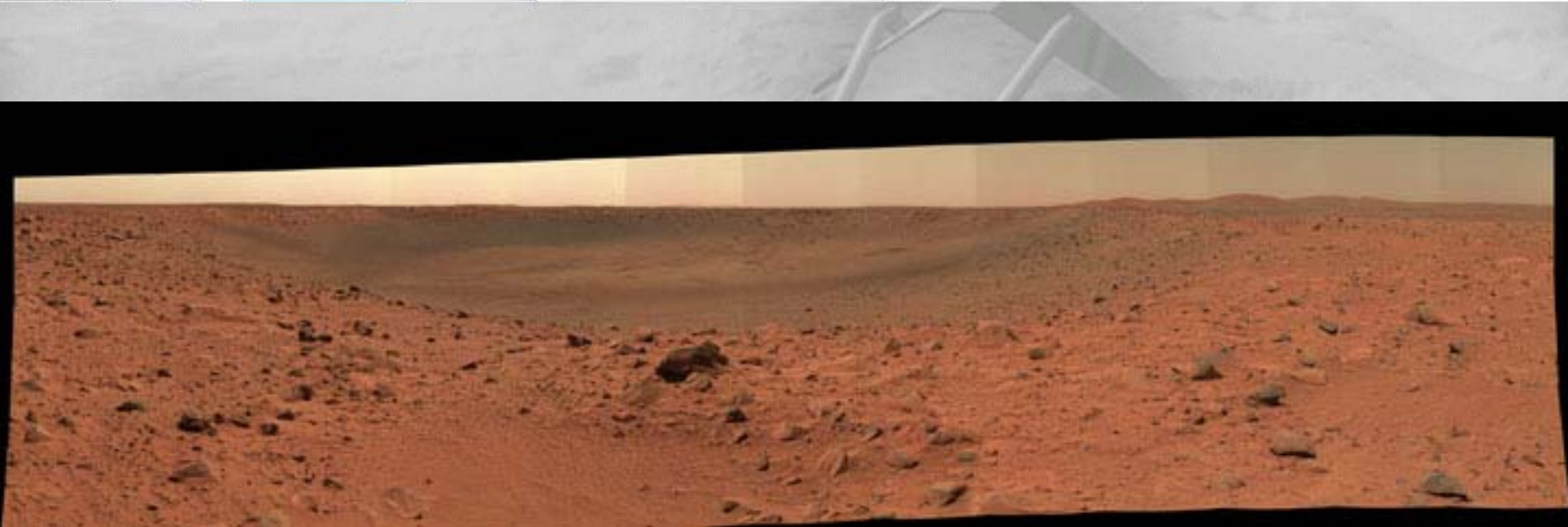


A Hole In Humphrey



This false-color image taken by the panoramic camera on the Mars Exploration Rover Spirit shows the rock dubbed "Humphrey" and the hole drilled into the rock by the rover.

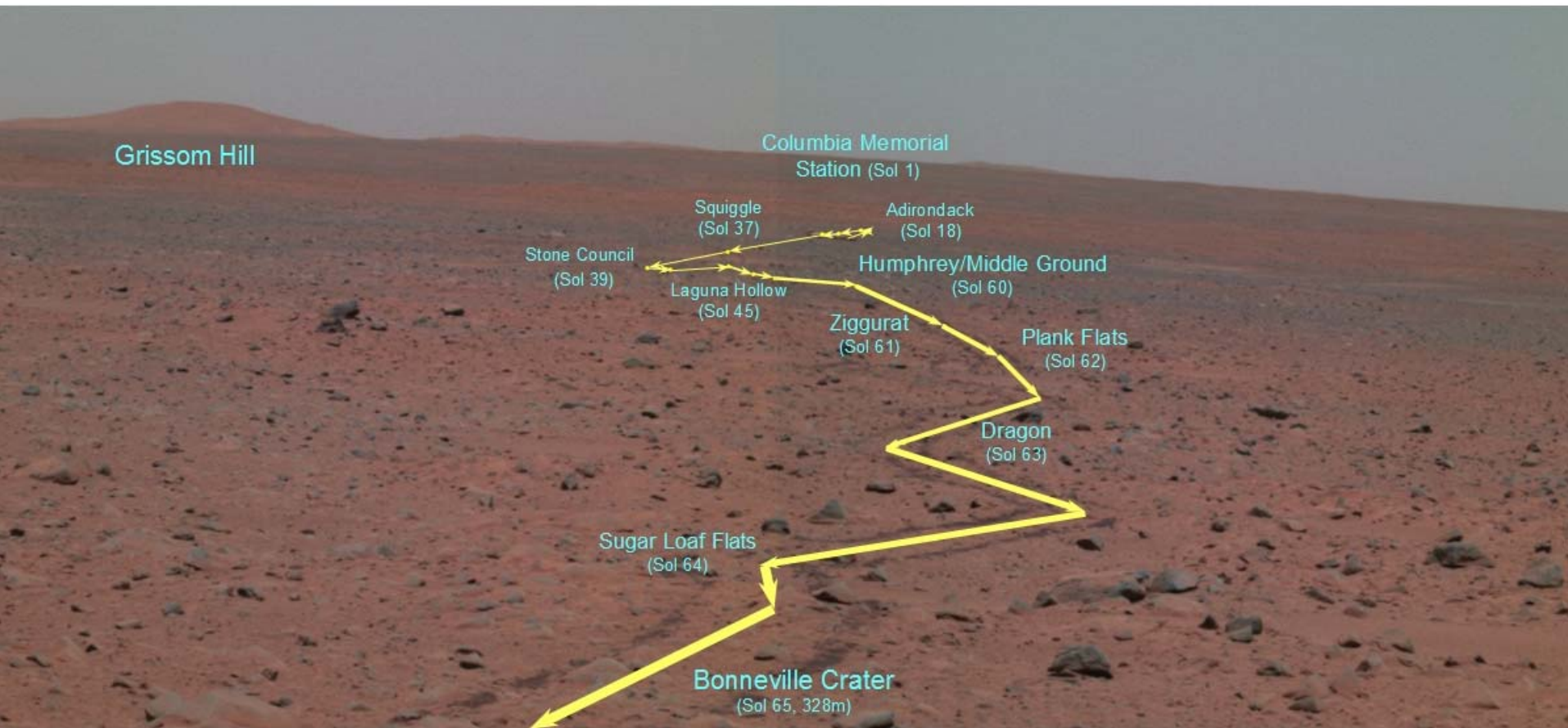
The particular filters used were chosen to enhance features of scientific interest.



The rim and interior of a crater nicknamed "Bonneville" dominate this 180-degree, false-color mosaic of images taken by the panoramic camera of NASA's Mars Exploration Rover Spirit. Spirit recorded this view on the rover's 68th sol, March 12, 2004, one sol after reaching this location. On sol 71, Spirit was instructed to drive approximately 15 meters (49 feet) along the crater rim to a new vantage point.



Spirit Rover Traverse – Bonneville Crater (Sol 65)



Mapping and GIS Laboratory, OSU

Our Deepest Hole on Mars! Meridiani Plains

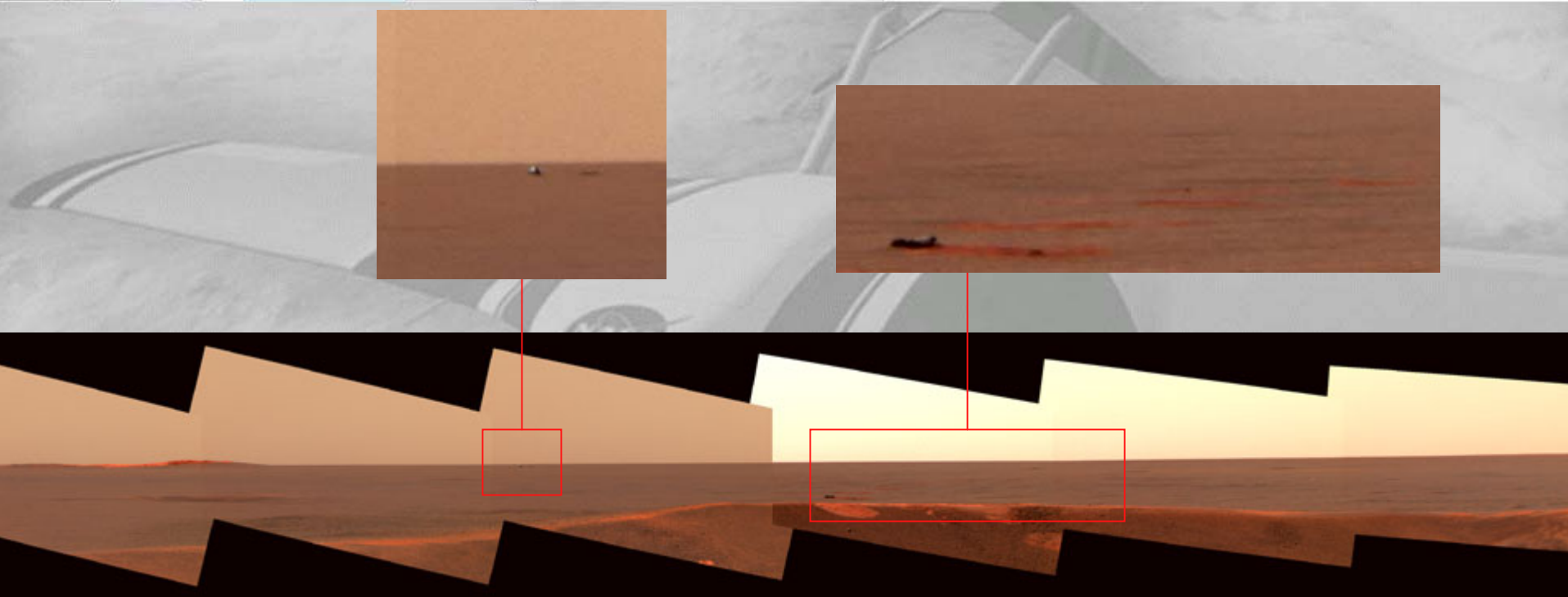


**Opportunity
Dug this
6 inch deep
Trench
On Mars.
White is
compacted
soil**



**Spherical
“nodules”
may be
water-related
concretions,
which could
be a clue to a
watery past
on Mars.**

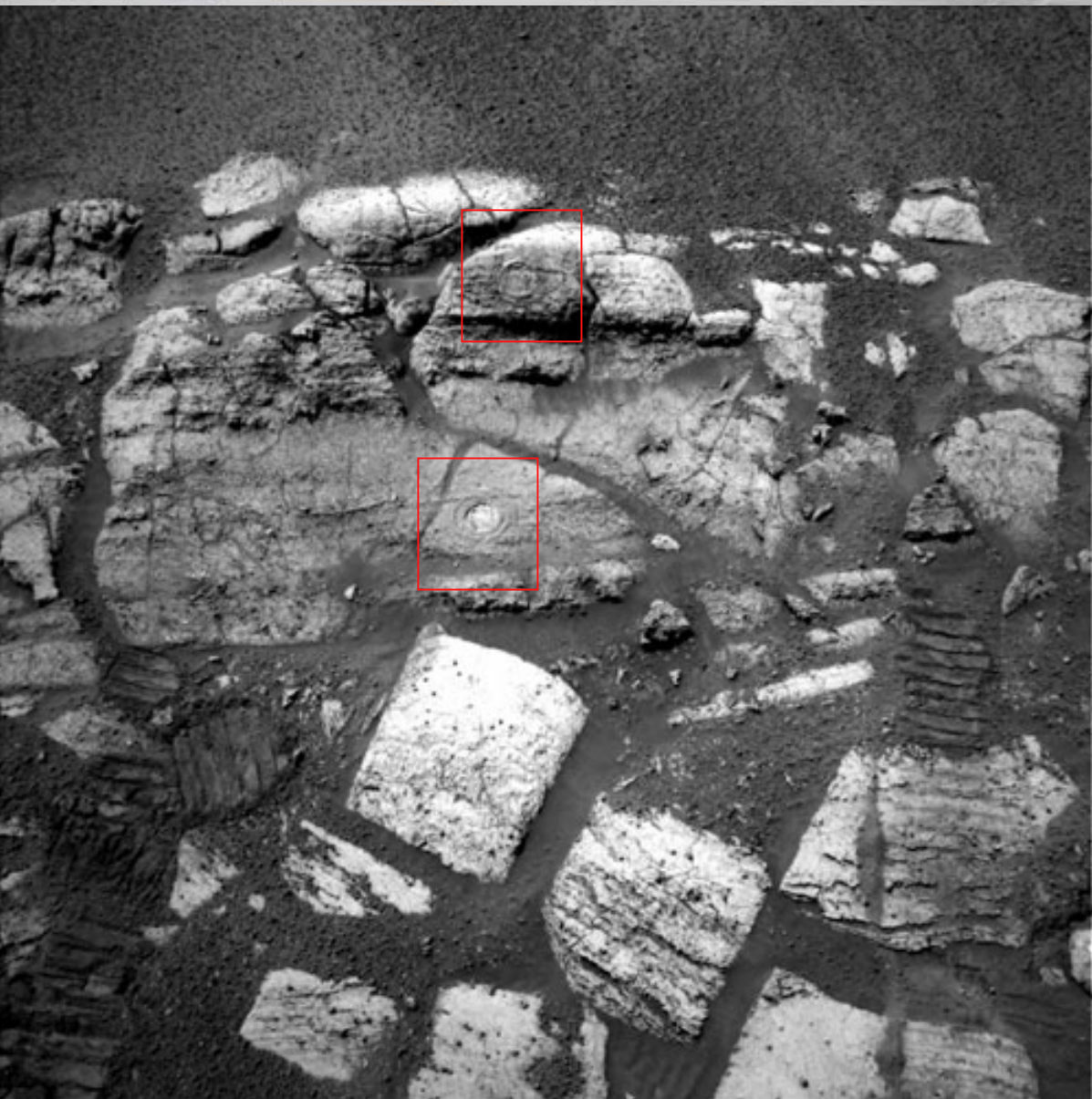
Opportunity's Heatshield on the Horizon



This image mosaic from the panoramic camera on the Mars Exploration Rover Opportunity shows the distant horizon from Opportunity's position inside a small crater at Meridiani Planum, Mars. To the left is a large crater about 700 meters (2,296 feet) away from the landing site and approximately 200 meters (656 feet) in diameter. In the center, Opportunity's heatshield and its impact mark can be seen at a distance of approximately 875 meters (one-half mile) from the landing site. To the right, a string of bounce marks left by the rover's airbags is visible.



Evidence of a Water-Soaked Past



This navigation camera image taken by the Mars Exploration Rover Opportunity on the 36th martian day, or sol, of its mission (March 1, 2004) shows the layered rocks of the "El Capitan" area near the rover's landing site at Meridani Planum, Mars. Visible on two of the rocks are the holes drilled by the rover, which provided scientists with a window to this part of the red planet's water-soaked past.



- NASA Vision
- National Space Exploration Initiative
- Current Mars Exploration
- **Aeronautics Exploration**



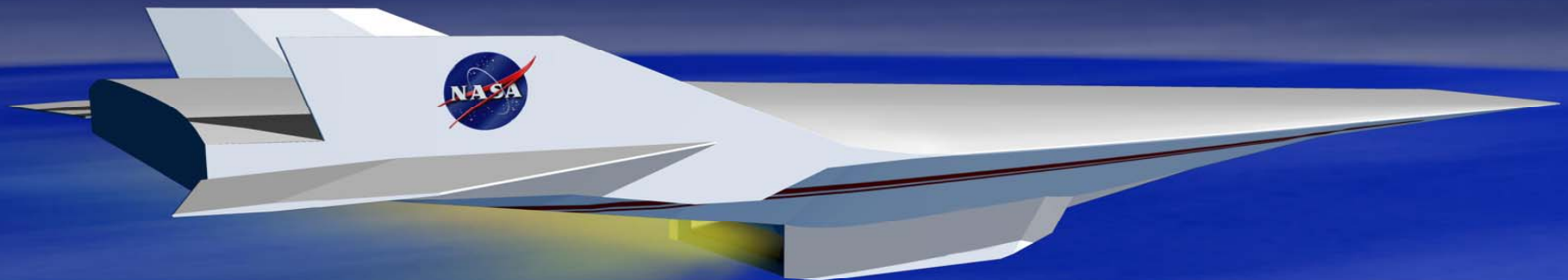


To pioneer and validate high-payoff aeronautical technologies

To improve the quality of life

To enable exploration and discovery

To extend the benefits of our innovation throughout society.

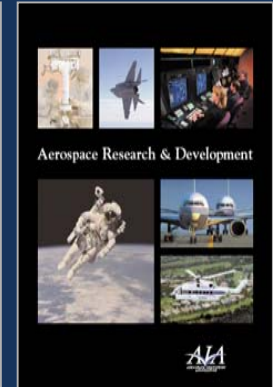
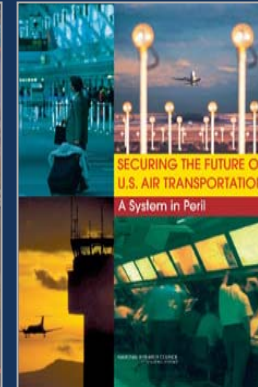


Our success is measured by the extent to which our results are used by others to improve the quality of life and enable exploration and scientific knowledge

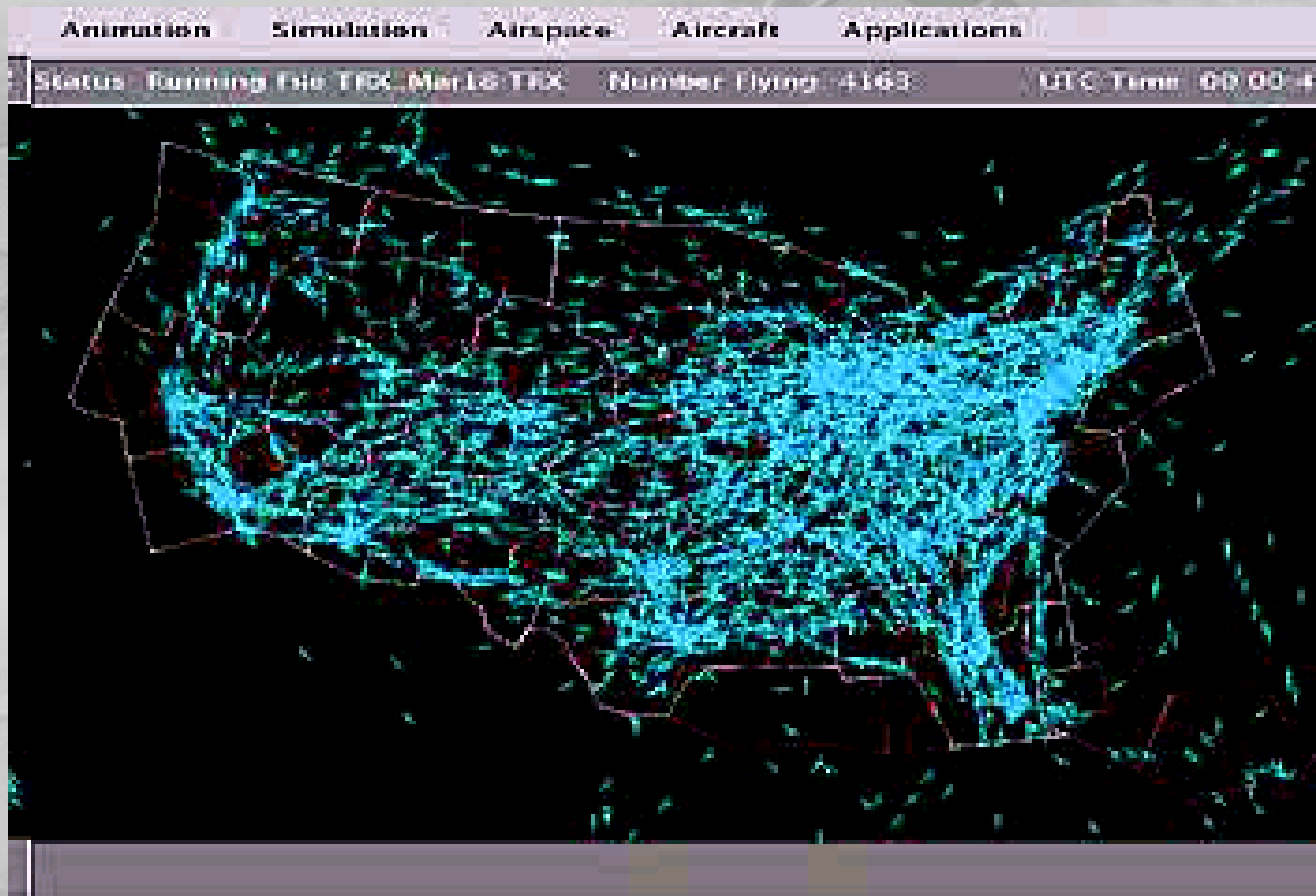


Recommendations Matrix

Recommendations



National Aerospace Vision	X	X	X	X
National Aerospace Leadership	X	X	X	X
Fund Long Term Basic R&D	X	X	X	X
National R&D Coordination	X	X		X
Core Capabilities (Infrastructure)	X			X
Form FAA/NASA Joint Program Office	X		X	X
Technology Demonstration	X	X	X	
Transforming the National Airspace System	X	X		X
Government Industry Partnerships	X	X		X



- Transformation is technologically-enabled change to the system to meet conflicting requirements or to reverse trends
- For example, consider that we need to...
 - Increase ATM productivity while increasing the scalability of the system to handle greater complexity and density of aircraft flows with no degradation for most IMCs
 - Reduce seat-mile costs for small aircraft to allow market-driven penetration of smaller community markets while reducing net fleet environmental impact.
 - Increase airport productivity and efficiency for travelers and shippers while increasing airport security.

- NASA is uniquely qualified to develop advanced technologies to support such transformation

F-5SSBD Shaped Sonic Boom Recorded August 27, 2003

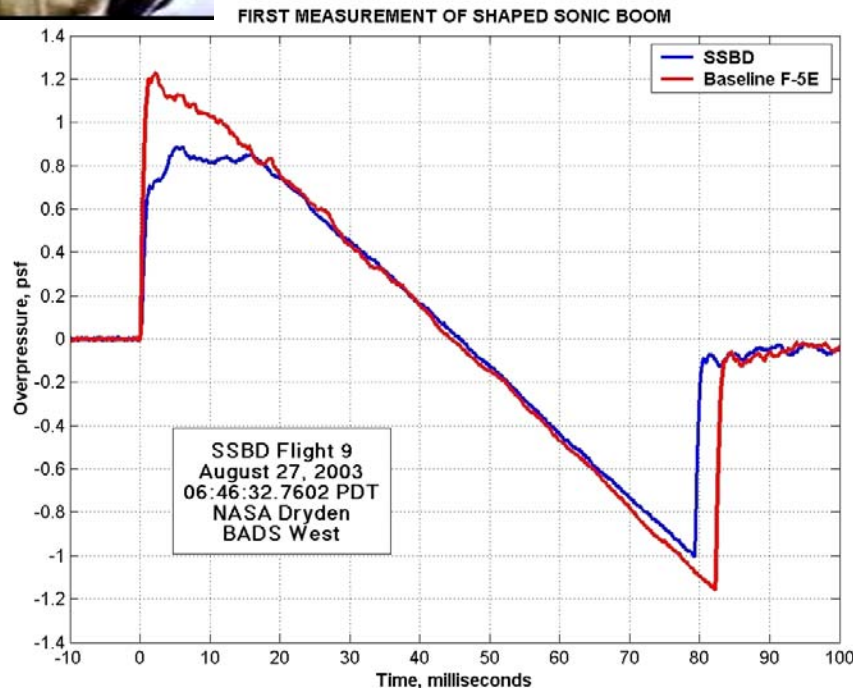


F-14 Low Level and Fast

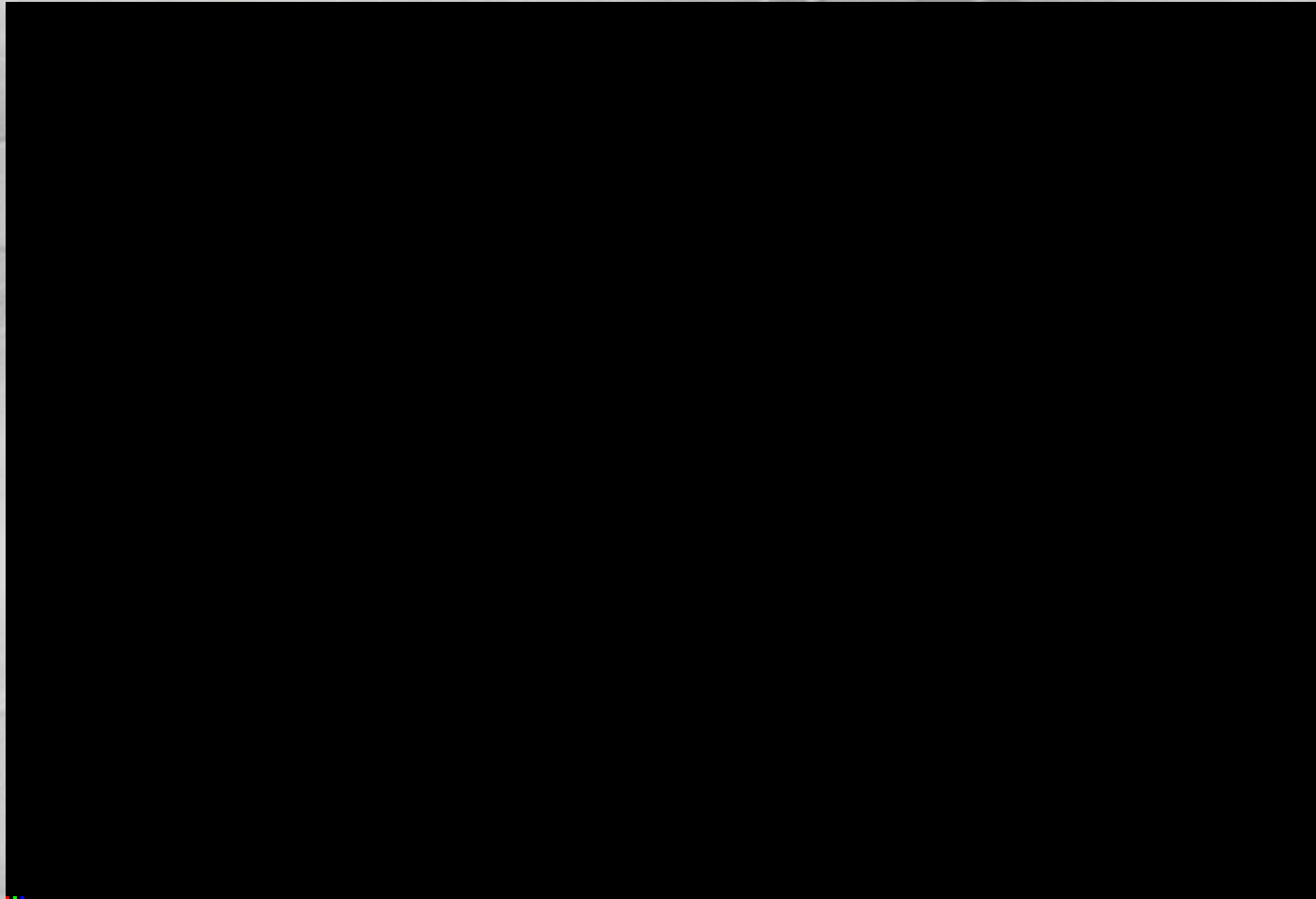
Ground pressure signatures recorded during SSBD Flight 9, back-to-back data flights in the Edwards AFB supersonic flight corridor early morning, Estimated conditions:
Mach 1.36,
Altitude 32,000 ft



F-5 SSBD Aircraft









Milestones in Flight History Dryden Flight Research Center



X-43A

• **Successful Launch from B-52 Mothership**

March 27, 2004

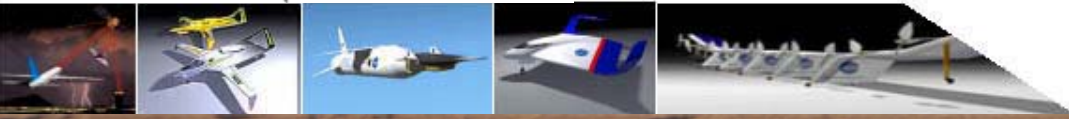




Aerial Regional-scale Environmental Survey of Mars Animation

On December 17, 1903, the Wright brothers changed the way we view our planet when they successfully completed the first powered airplane flight...





**The Wright brothers took humankind to our sky.
Let us fully utilize and protect our sky and
enable humankind to explore other skies.**

